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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/506,425      | 02/17/2000  | Sara Giordani        | AM-3751             | 7521             |

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APPLIED MATERIALS, INC.  
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SANTA CLARA, CA 95050

EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 05/20/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/506,425

Examin r

Allan W. Olsen

Applicant(s)

GIORDANI, SARA

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-10,12-16,23,24 and 27-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-10,12-16,23,24 and 27-34 is/are allowed.
- 6) ☒ Claim(s) 35-37 and 42-49 is/are rejected.
- 7) ☒ Claim(s) 38-41 and 50-53 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

**Claims 47-49 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent 5,891,807 issued to Muller et al. (hereinafter, Muller).**

Muller teaches reducing the pressure in a plasma chamber while etching a shaped cavity. The pressure is reduced preferably between 20% and 45%. See column 5, lines 30-43 and column 6, lines 8 and 33.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 35-37, 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of U.S. Patent 5,182,234 issued to Meyer.**

Muller teaches reducing the pressure in a plasma chamber while etching a shaped cavity. The pressure is reduced preferably between 20% and 45%. Muller teaches etching silicon with an etchant comprising NF<sub>3</sub> and He. The etchant also includes HBr and O<sub>2</sub>. Muller teaches that a sidewall passivation layer forms in the first stages of the etching process. As Muller is etching silicon with an oxygen containing plasma, the sidewall passivation would inherently comprise silicon dioxide. See: column 4, lines 29-49; column 5, lines 30-43; and column 6, lines 8 and 33.

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Muller does not teach an etchant that comprises SF6 and Ar.

It would have been obvious to one skilled in the art to use an etchant that comprises SF6 and Ar because Meyer teaches that SF6 and Ar are functionally equivalent to Muller's NF3 and He, respectively.

See the following *Response to Arguments* for a discussion regarding the examiner's treatment of the newly recited "consisting essentially of" claim language.

### ***Response to Arguments***

Applicant's arguments filed March 4, 2003 have been fully considered but they are not persuasive. In response to applicant's argument that Muller, either alone or in combination with Meyer, fails to show a certain feature of applicant's invention, it is noted that the feature upon which applicant relies (i.e., a multi-step process wherein "applicant's step 1... is... followed by a distinct and independent step b") is not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In addition, applicant argues that Muller's teachings and Meyer's teachings are incompatible because they require different or opposing operating conditions. As such, applicant argues, because those of skill in the art would not combine the teachings of these two references, Muller and Meyer do not render the claimed invention obvious.

The examiner acknowledges that the processes of Muller and Meyer are carried out under different conditions. However, the examiner is not persuaded that these different operating conditions would dissuade the skilled artisan from the widely taught notion that, as silicon etchants, SF6 and NF3 are functionally equivalent. Applicant argues against the asserted equivalence of Ar and He by stating that, under a given set of operating conditions, the use of Ar will provide a higher etch rate because Ar is more massive than He. Again, the examiner acknowledges this well known fact. However, the examiner believes that it is well within the ordinary skill level to modify the given set of conditions (e.g. change the bias power) in order to realize the equivalence of Ar and He that is taught by Meyer.

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Regarding the newly recited “consisting essentially of” claim language, the examiner notes the following excerpt from the MPEP that explain that this phrase can be treated as being of closed claim language or as being of open claim language.

Excerpt from MPEP 2111.03 (with emphasis added)

“A consisting essentially of claim occupies a middle ground between closed claims that are written in a consisting of format and fully open claims that are drafted in a comprising format.” PPG Industries v. Guardian Industries, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also Atlas Powder v. E.I. duPont de Nemours & Co., 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); In re Janakirama-Rao, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); Water Technologies Corp. vs. Calco, Ltd., 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, “consisting essentially of” will be construed as equivalent to comprising.” See, e.g., PPG, 156 F.3d at 1355, 48 USPQ2d at 1355.

The phrase “consisting essentially of” must be treated as being either open or closed. Interestingly, because of the relationship between claims 35 and 42-44, the examiner finds the Meyer/Muller rejection to be valid, regardless of which claim interpretation is adopted.

Claim 35 recites “...a source gas consisting essentially of SF<sub>6</sub> and Ar.” Claims 42-44 are dependent upon claim 35. Claims 42-45 are each directed to the inclusion of additional plasma source gases. Therefore, if one considers the claim as being closed, the only gases that could be added to the system of claim 35 would be those that do not materially affect the basic and novel characteristic of the claimed invention. As such it follows that the gases being added by claims 42-44 must not materially affect the basic and novel characteristic of the claimed invention. To argue otherwise, one would be requiring claims 42-44 to impose a limitation that is contrary to a requirement that is established by the base claim, claim 35. Therefore, the Meyer/Muller rejection is applicable because these references only add gases that are defined by claims 42-45, by virtue of their dependence upon claim 35, as being gases that do not materially affect the basic and novel characteristic of the claimed invention.

Alternatively, the claim can be treated as being open. As such, the claims would essentially be equivalent to the previous version and the Meyer/Muller rejection of previous Office action would be applicable for the reasons stated therein.

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***All wable Subject Matter***

Claims 5-10, 12-16, 23, 24, 27-34, are allowed.

Claims 38-41 and 50-53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

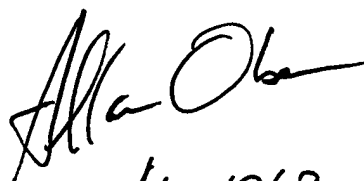
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633.

The general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.  
May 7, 2003

  
AU.1763